EPA Region 7 TMDL Review

TMDL ID	219	*Water Body ID*	IA 05-PLA-00335-L
Water Body Name	Lake of Three Fires		
Pollutant	Siltation and Nutrients		
Tributary			
State	Iowa	*HUC*	102400130104
Basin	Southern Iowa River Basin		
Submittal Date	12/16/2002		
Approved	Yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Submittal letter dated December 13, 2002 was received on December 16, 2002.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Siltation and nutrients are impairing the beneficial uses of aquatic habitat, spawning and reproduction, and sport fishing. Iowa does not have numeric water quality criteria for siltation or nutrients. Instead, the impairments were based on the best professional judgement of IDNR staff using narrative criteria. For sedimentation, the load capacity for Lake of Three Fires was determined to be 569 tons/year. For nutrients, a load capacity of 2,146 pounds/year of phosphorous. Achieving both of these values should result in IDNR WQS attainment. This is a phased TMDL.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Water quality standards, beneficial uses, and narrative criteria are discussed. CNET and EUTROMOD models were used to calculate current loads and reductions needed to meet WQS.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

Excessive amounts of siltation and nutrients is believed to be altering the physical and chemical characteristics of the lake such that a balanced aquatic community is not being maintained. Because of the impact on aquatic life, TMDL targets include siltation and nutrient loads. Because of the lack of numeric criteria for nutrients, Carlson's TSI was used for target load allocations. Phase 1 is to reduce phosphorous TSI to 70 or below hyper-eutrophic conditions. However, as sediment and phosphorous is reduced, transparency may improve and thus lead to algal blooms. Algae could become prominent and begin to express excess nutrients. Therefore, the desired phase 1 target is to reduce the total phosphorous TSI to 70 or below and maintain the chlorophyll-a TSI and transparency TSI at or below 70.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

There are no point source dischargers in the watershed. Non-point sources are described including a hog confinemet in the watershed that has the highest potential for causing problems. This hog confinement establishement is constantly monitored. Presently, 40% of the watershed is enrolled in the Conservation Reserve Program (CRP). If CRP does not continue and the ground is planted, sediment delivery rates are expected to increase. Agricultural best management practices in the past 10-20 years resulted in a 90% loss in sediment delivery from 1991 to 2002. Terraces are being installed post-harvest 2002 on land that receives manure application that will improve soil conservation practices in the watershed.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

Phase 1 of this phased TMDL is to reduce current siltation and nutrient loads. The siltation target is set at 569 tons/year. Nutrient target is set at 2,146 pounds/year of phosphorous. Phase 2 will evaluate the effect of the siltation and nutrient targets on the aquatic community. Targets may be revised in phase 2.

WLA Comment

Wasteload allocation is zero.

LA Comment

Load allocation for siltation is 569 tons/year. Load allocation for nutrients is 2,146 pounds/year of phosphorous.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The margin of safety is implicit. The multiple targets for this TMDL assures that the aquatic life uses will be restored regardless of the accuracy of the phase 1 siltation and nutrient delivery targets. Failing to achieve beneficial use will result in a review of the TMDL, allocations, and/or sediment management approaches.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Seasonal variation is accounted for by acknowledging that loading varies substantially by season and between years and impacts are felt over multi-year timeframes.

Public Participation

Submital describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings were held in Des Moines and Bedford on January 14, 2002 and January 29, 2002. Draft version of the TMDL was put on public notice from November 14 through December 6, 2002. Public comments were incorporated into the TMDL when approriate.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Monitoring will continue as part of the Iowa Lakes Survey. Monitoring of Lake of Three Fires will be completed three times per year for each of the field seasons from 2000 to 2004. IDNR Fisheries Bureau will begin watershed monitoring in 2003 and will also conduct a fish assessment in accordance with the Statewide Biological Sampling plan

protocol. This assessment will be completed after the lake restoration project. And with the completion of the assessment, data will be evaulated to determine the lake's listing status.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Reasonable assurance is not discussed because there are no point sources contributing to the aquatic life impairment.
